



FRIDAY, OCTOBER 6, 1876.

The Westinghouse Train Speed Indicator.

All railway engineers who have been engaged in experiments on brakes or other investigations requiring the speed of a train to be correctly ascertained, have felt the want of a trustworthy indicator which should not only show the speed of the train at

water under pressure by means of a small valve loaded by the action of centrifugal force, the arrangement being such that the higher the speed at which the apparatus is driven, the greater will be the pressure exerted by certain revolving weights upon the escape valve, and the higher therefore the pressure maintained within the chamber with which this valve communicates, this chamber, we may add, constantly receiving a supply of water either from pumps or from the engine boiler. A pressure gauge affixed to the chamber containing the water under pressure, thus affords by its indications information as to the speed at which the apparatus is being driven. Although very simple in principle, however, much ingenuity has been required to bring the apparatus into such a form that its indications shall be trustworthy in practice, as will be seen from the following description of the details of the instrument.

Referring to Figs. 1, 2, and 3, it will be seen that the appara-

as shown in Fig. 2, this valve when open allowing any excess of water to escape through the hole *c* back into the water chamber *A*. Communicating with the passage *cc* there is also another channel *d*, shown in Fig. 3. This passage is fitted with a small check valve as shown, and through it the water delivered from the pumps can flow up to the socket *e* into which the spring accumulator *H* is screwed, as shown in Fig. 2. The construction of this accumulator will be readily understood. It consists of an india-rubber diaphragm having on its underside a small plunger against which the water acts, while on its upper side is another plunger or piston forced downwards by a spiral spring. The lower plunger has a small rod or needle projecting from it, this needle being very slightly tapered, and the water on leaving the accumulator passing down around this needle to a channel *ff* leading to a second accumulator *I*. This second accumulator is similar to the first, with the exception

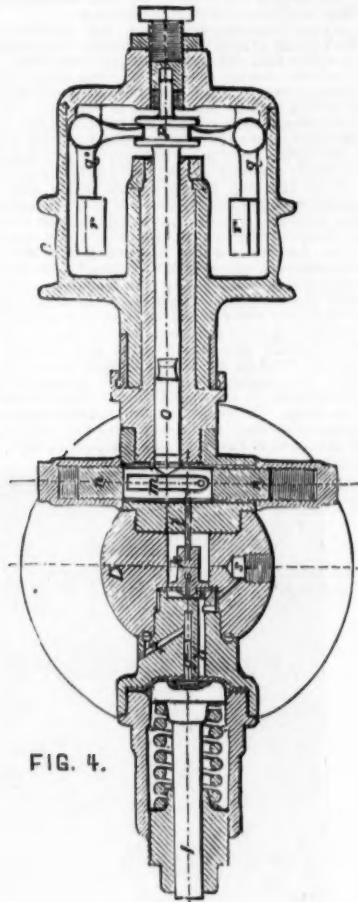


FIG. 4.

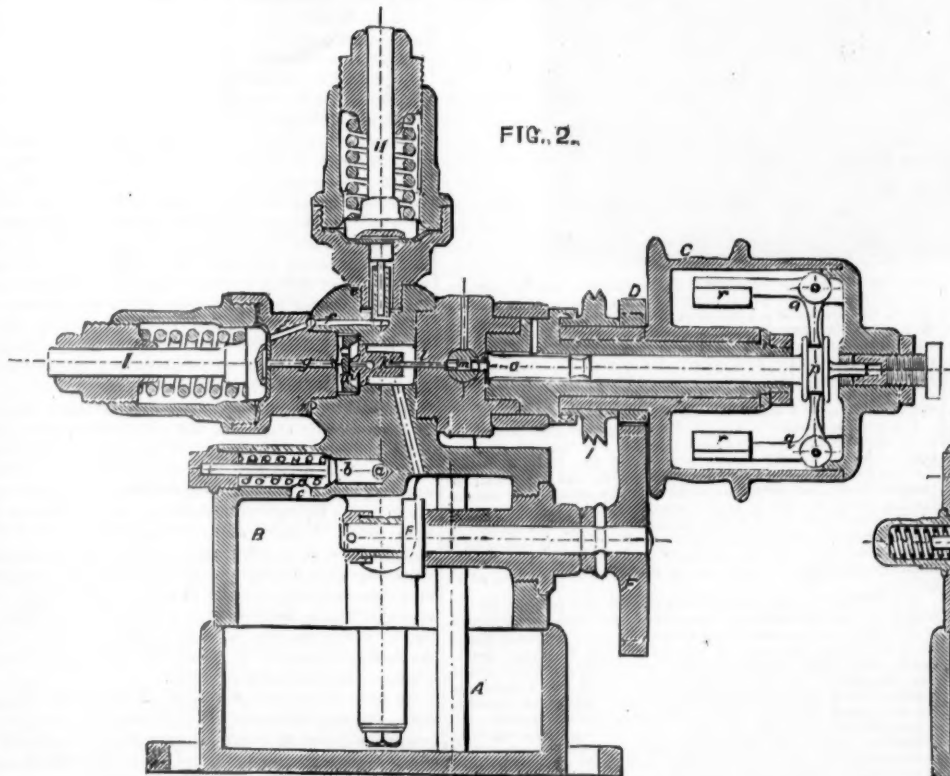


FIG. 2.

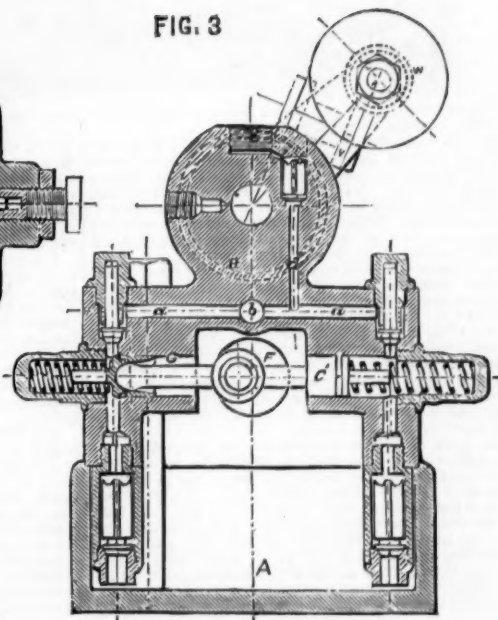


FIG. 3.

THE WESTINGHOUSE TRAIN SPEED INDICATOR.

any given instant, but which should also allow of diagrams being taken recording the fluctuations or diminutions of that speed caused by the application of the brake. It is of such an instrument, designed by Mr. George Westinghouse, Jr.,—the inventor of the well-known air-brake bearing his name—of which we now give illustrations.

Mr. Westinghouse's speed indicator is shown by our engravings in two forms, that represented by Figs. 1, 2 and 3 being intended for fixing in a carriage or van, and that shown by Fig. 4 being adapted for use on an engine, the pumps for supplying water under pressure being in this latter case omitted, and water for actuating the apparatus being drawn from the boiler. In other respects, with the exception of some minor details to which we shall refer presently, the two forms are identical.

The principle upon which the apparatus acts is very ingenious and its application to a speed indicator is, so far as we know, entirely novel. It consists in controlling the escape of

tus consists of a base *A*, forming a small water tank, there being bolted down to this base a casting *B* carrying all the rest of the parts. To one side of the casting *B* is fixed a tubular axis on which is mounted the pulley or casing *C*, which is driven by a belt from another pulley on any convenient axle, care being taken, however, that the wheels on this axle are not fitted with brake blocks. Fixed to the pulley *C* is a pinion *D* which gears into a small spur wheel *E* mounted on a spindle provided at its other end with a disc crank *F*. From this crank are led off two connecting rods *G G*, which work small plunger pumps drawing water from the water chamber *A*. The arrangement is clearly shown in Fig. 3, from which it will be seen that the pistons or short plungers of the pumps are forced outwards by springs, so that the connecting rods work constantly in compression, and the pumps can thus be driven at a high speed without their being any "knocking" of joints.

The two pumps deliver water through channels *a a* into the channel *b* which is fitted with a small spring loaded relief valve

that it is disposed horizontally instead of vertically, and by the time the water reaches it the pulsations caused by the action of the pumps are entirely destroyed. In this second accumulator the water may thus be considered to be contained at a steady pressure, the amount of this pressure depending upon the arrangements we have yet to describe.

When the instrument is fixed on an engine, and the supply of water required is drawn from the boiler instead of being supplied by pumps, the first accumulator is dispensed with, one only being employed, as shown in Fig. 4. In this case, the water instead of entering the accumulator near the periphery, and escaping at the centre course, it entering through the passage *f* (Fig. 4), passing into the accumulator around the needle *g*, and escaping through the passage *h* to the regulating escape valve.

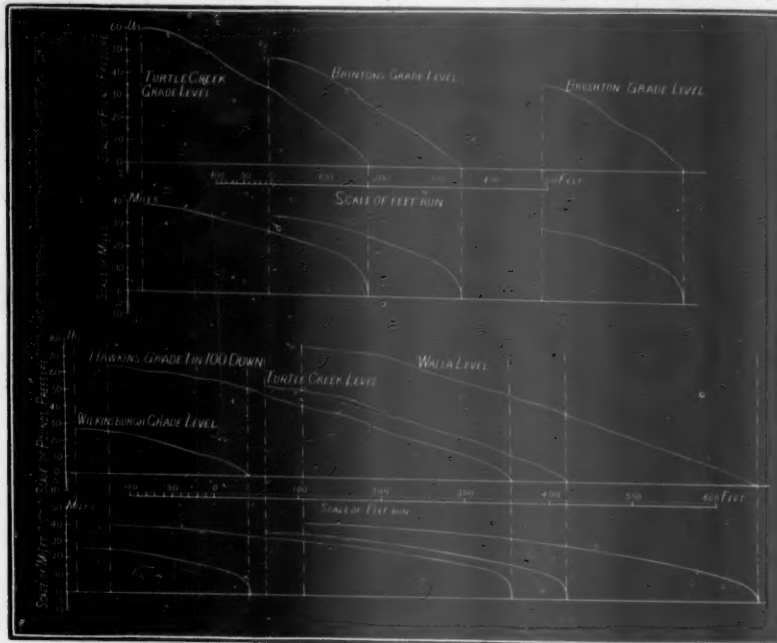
Returning to Fig. 2 it will be seen that the water can escape from the second accumulator past the needle *g* into the passage

A, which is connected by small holes with a recess *i* covered by a thin india-rubber diaphragm attached to the relief valve *k*. The form of this latter valve is, as will be seen, such that when raised from its seat the water flows out through a central opening in the valve into a small chamber, from which it can return through a passage shown in Fig. 2 into the water reservoir *A*. We have now to describe how the pressure upon the relief valve *k* is adjusted.

It will be seen from Figs. 2 and 4 that the relief valve *k* has attached to it a rod *l*, which takes a bearing against a small horizontal lever *m*, as shown. This lever is also pressed against at another point by the rod or spindle *o*, and it will be seen from Fig. 4 that the lever is contained in a recess or mortise cut in a bar *n*, so that by turning the screwed caps with which the ends of this bar are fitted, the lever can be shifted longitudinally, and the ratio which the pressure exerted by the spindle *o* shall bear to that transmitted to the rod *l* can thus be adjusted with great delicacy.

As will be seen from our engravings, the spindle *o* extends through the tubular axis on which the pulley *C* is mounted, and is provided within that pulley with the grooved collar *p*, which takes hold of the shorter arms of the two bell-crank levers *q*. The other arms of these levers carry small weights *r*, and it will be seen that as the pulley *C* revolves, the centrifugal force developed tends to spread these weights, and thus through the intervention of the bell cranks exerts a pressure longitudinally on the spindle *o*. But this spindle transmits its pressure through the lever *m* and rod *l* to the escape valve *k*, and thus we see that the pressure with which this valve is loaded depends upon the centrifugal action of the weights *r*.

The whole action of the apparatus will now be clear. The centrifugal force exerted by the weights *r* will vary as the square of the velocity at which the pulley *C* is driven, and hence the pressure on the escape valve *k* will also vary as the square of the velocity of the pulley *C*, or what is the same thing the square of the velocity at which the train is moving. But a constant supply of water is delivered to the accumulator *I* from the pumps (or from the engine boiler, as the case may be), and the pressure maintained within this accumulator is controlled by the load on the escape valve *k*, hence a pressure gauge placed in communication with the accumulator *I* will indicate pressures which are proportional to the squares of the speeds of the train. To connect it with the accumulator *I* the pressure gauge is screwed into the socket *s* (see Fig. 4), and a gauge thus arranged is shown in the perspective view, Fig. 1.



From the indications of this gauge the speed of the train at any instant can be at once ascertained.

But it was desired by Mr. Westinghouse not only to be able to ascertain the speed of the train at any given instant, but to be able to take a diagram recording the decrease of speed after the application of a brake, and for this purpose the apparatus we are describing is fitted with attachments for connecting to it a suitable indicator. This indicator is connected at *s* (see Fig. 4) at the same point as the pressure gauge, and its drum is driven by the arrangement we are about to describe.

Referring to the perspective view, Fig. 1, and to Figs. 2 and 3 it will be seen that the pulley *C* has fixed to it a short worm *t*, into gear with which the small worm wheel *u* can be placed. Another worm *v* on the same axis as the wormwheel *u* drives another wormwheel *w*, and a slow motion is thus given to the disc from which the cord for moving the paper drum of the indicator is driven. A slow motion is thus obtained for the drum of the indicator. The indicator employed is not shown in our engraving, but it is similar to the ordinary steam engine indicator, except that the paper drum is somewhat larger, its circumference being 12 in.

If now the gear for giving motion to the paper drum be thrown into action at the same time as the brake is applied, the pencil of the indicator being at the same time in contact with the paper, it is evident that as the speed of the train becomes reduced the pencil of the indicator will fall, and this downward movement combined with the rotary motion of the drum will cause an inclined line to be traced on the paper, the height of this line above zero at any given point being a measure of the speed of the train at the corresponding point of its forward movement.

To explain this better we reproduce to a reduced scale in the annexed engraving some diagrams taken by this apparatus on a train on the Pennsylvania Railroad, Pittsburgh Division. The train on which these experiments were made weighed about 170 tons, and consisted of an engine and tender and six double-bogie cars, the whole of the wheels on the train with the exception of those of the engine truck being fitted with single brake blocks actuated by the Westinghouse automatic brake. The air brakes had been in use on the train for six years and had been converted to the automatic system in 1873. In regular work the train made over 200 stops each day, and no special work was done to put the brakes in order for the trials. The latter thus show what the Westinghouse automatic brake can do in regular work and after much service. The speed indicator during the trial received its motion from the front axle of the engine, and the case or pulley *C* containing the bell cranks with the weighted arms was driven so that it made one revolution for each 6 ft. of forward movement of the train. The paper drum of the indicator (which, as we have said, is 12 in. in circumference) revolved once for every 1,200 ft. of forward movement of the train. The instrument is, however, provided with spare gears so that a slower movement of the paper drum can be given if required. Of the diagrams an-

nexed the three in the upper row correspond to stops made on the 28th of June last under the following conditions:

Place where stop was made.	Speed in miles per hour.	Distance run after application of brake.
Turtle Creek (line level).....	39	412
Brintons (line level).....	34½	352
Brushton (line level).....	31	260

The four other diagrams in the third row refer to experiments made July 3 last, the particulars being as follows:

Place where stop was made.	Air pressure pounds per square inch.	Speed in miles per hour.	Distance run after application of brakes.	Time making stop.	Speed in miles per hour after running the subjoined distances beyond point of application of the brake.
					100 ft. 200 ft. 300 ft. 400 ft. 500 ft.
Wilkinsburgh.....	70	26½	208	sec. not taken	22
Hawkins.....	55	40½	484	14	39 34 29½ 22
Turtle Creek.....	90	37	364	13	34½ 27½ 19
Walls.....	85	49½	550	15	42½ 38 33 28½ 17½

During these last trials the stop-watch was unfortunately lost off the engine, so that the time is not accurate to a fraction of a second. The performance of the brake during these trials was, as will be seen, admirable; but this is a matter of which we shall speak on another occasion; at present we are dealing with the diagrams before us. As we have already explained, heights in these diagrams represent pressures in the accumulator of the speed indicator, and these pressures again

are proportioned to the squares of the speeds. In the particular instrument from which our perspective view has been prepared, the square of the speed in miles per hour multiplied by 0.04 gives the corresponding pressure in pounds per square inch in the accumulator. It is thus easy to reduce the pressure curves drawn by the indicator to the equivalent speed curves, and this we have had done for the several experiments above referred to, each pressure curve having the corresponding speed curve shown below it.

It is evident that the curves drawn by the instrument we have described afford the fullest possible information respecting the action of the brake with which the train is fitted. Thus not only do they show the distance run and the mean retarding force, but they also afford data for calculating the retarding force exerted at each point of the stop, and thus show whether the brake power was applied promptly—as it should be to obtain the best results—or whether it only came into action gradually, and thus involved a loss of time at the commencement of the operation when the train was moving most quickly.

It is for want of accurate information on the points just referred to that erroneous estimates of the value of different brakes have so frequently been made. In the celebrated brake trials at Newark last year it was attempted to obtain trustworthy information respecting the rate of diminution of speed after the brakes had been applied by means of an electric apparatus which we described at the time, this apparatus recording the times at which the experimental trains passed over contact pieces placed 200 ft. apart. The arrangement was well carried out, and every effort was made to secure accuracy, but nevertheless the system, as a whole, was vastly inferior to that of obtaining a continuous record of speeds, such as is afforded by the instrument forming the subject of the present notice.

We have in the present article merely described Mr. Westinghouse's ingenious speed indicator, and pointed out generally the data which it enables us to obtain; in an early number, however, we propose to enter more fully into the nature of these data, and to show how the efficient action of continuous brakes depends upon the fulfillment of certain conditions to which attention is, we think, not sufficiently directed. In concluding for the present we may express a hope that some arrangement may be made for a regular series of trials in this country of trains fitted with different brakes, and each provided with one of the speed indicators we have described. Such trials could be readily carried out, and they would afford railway companies information even more complete than that which, after being obtained with so much trouble fifteen months ago, is still so carefully withheld from the public by the Royal Commission on Railway Accidents.—*Engineering*.

—Mr. G. Smith has resigned his position as Master of Transportation of the Columbus Division, Cleveland, Columbus, Cincinnati and Indianapolis Railroad.

Contributions.

The Justifiable Expenditure for Improvement in the Alignment of Railways.

BY A. M. WELLINGTON, C. E.

[Copyrighted 1876, by the Railroad Gazette.]

[Continued from Page 423.]

REDUCTION OF RULING OR MAXIMUM GRADE.

A maximum grade causes an increased expense, which depends for its amount on the elevation attained, like all other gradients. This is practically independent of the rate of ascent, and we have already considered it in the previous chapter, under the head of RISE AND FALL. It is that portion of the expense of gradients which directly and invariably appertains to them, or what we have termed the *inherent* expense of any deviation from a level.

In addition to this the MAXIMUM grade of a line usually has the distinct and far more important effect of increasing either the number or the weight of engines (in other words, the ENGINE TONNAGE, as we shall hereafter term this composite quantity) which is required to transact the business of the road, thus increasing the expense of operating the entire line; and a mile or two of heavy grade will thus limit the weight of trains as effectually as 20 miles. It is this effect of gradients which we propose now to consider. In only one case does the maximum grade fail to have this effect, viz., when the curvature is so sharp and the gradients so low that the curves intervene in advance of gradients to limit the weight of trains. This is very rarely the case, but in order that such an effect from curvature may be avoided without needless and wasteful expenditure, the minimum radius permitted should be correctly adjusted to the maximum gradient. This is one of the most important and most neglected subjects connected with the location of railways, and we shall separately consider it before completing this paper. It is often absurdly and arbitrarily decided.

The effect of the highest rate of grade in fixing the engine tonnage is an external or accidental attribute, as we have seen under the head of Rise and Fall, which depends solely on the rate of ascent and not at all on the elevation attained; while exactly the reverse is the case with that inherent and universal expense from gradients which has no limiting effect, but results from all ascent and descent, whatever the rate. For example, let us suppose we have a located line 90 miles long with a maximum grade at all points of the line of 40 feet per mile, except two or three miles of 50 feet grade. Now in deciding upon the location of the latter, a very great expenditure per mile may be justifiably incurred to reduce the rate of the 50 feet grade to 40 feet per mile, and in addition thereto a certain amount of expenditure (and a very moderate amount) may be properly incurred to reduce the length of the grade, i. e., the height of the summit. Let us now suppose that it is subsequently decided to extend the line 10 miles further, and that on this extension the minimum gradient attainable, by any justifiable expenditure, is 52.8 feet per mile. The proper alignment for the original location is now very different, and the original alignment, if at first judiciously located, will require an entire readjustment. All expenditure to reduce the rate per mile of the 50 feet gradient has now ceased to be justifiable—except an inconsiderable fraction which we have considered under the head of Rise and Fall—and in addition thereto if anything can be saved (beyond the aforesaid inconsiderable fraction) by increasing the rate of the 40 feet grade and other minor gradients up to any rate less than the superior limit of 52.8 feet per mile, it should be done. The justifiable expenditure to reduce the height of the summit, however, or to avoid any other rise and fall, remains unaffected. The latter is the *inherent* expense of gradients, the former is external and accidental, and the two are wholly distinct and dissimilar, both in their nature and effect.

When the gradients are such that assistant engines may be economically employed, the effect of gradients and their proper adjustment is somewhat different. We shall consider that question hereafter. For the present, we assume that assistant engines are not intended to be used, but that trains are to be run through without change from one end of the line to the other. If trains are broken up at any point of the line, such distance as they are run through without change constitutes in effect a separate line or division, but the breaking up and recombining of trains at frequent intervals form a very expensive and undesirable necessity which is hardly susceptible of exact estimation, but should always be borne in mind. We shall have occasion to refer again to the subject hereafter when we have more data available.

We have been thus particular, in the above remarks, to define the subject we propose to consider because it is one of real difficulty and of undeniable intricacy, if the results finally obtained are to possess any value. It is not difficult to devise a short cut to an estimate. Several such are known to the writer. But the difficulty with them all, so far as the writer's knowledge extends, is that they are either based on incorrect premises or are otherwise easily capable of a *reductio ad absurdum*. Hence they will not stand practical tests, and are deservedly consigned to the limbo of forgetfulness in preference for the rule of thumb. And in the great majority of instances it is the thumb of the left hand, for the profound importance of well-adjusted ruling gradients to the financial future of any railway, in comparison with the more showy and striking improvements, such as a short line, flat curves and low summits, is hardly appreciated by many of the locating engineers who practically decide the balance between such matters in the field, and, if the seeming egotism may be pardoned, is not thoroughly comprehended and correctly understood in detail by many engineers of long experience and of distinguished ability. As to this fact "their works do testify," as we shall have occasion to see. For some inscrutable



Published Every Saturday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS:

Page.	Page.
ILLUSTRATION:	EDITORIALS:
The Westinghouse Train	The Coal Roads.....434
Speed Indicator.....431	The Men Who "Know It
CONTRIBUTIONS:	All".....435
The Justifiable Expenditure	Record of New Railroad Con-
in Improvement of Align-	struction.....435
ment of Railways.....432	EDITORIALS NOTES.....435
Train Resistances.....433	GENERAL RAILROAD NEWS:
Steel as a Material for	Elections and Appointments.....436
Wheels.....435	Personal.....436
Erecting Locomotive Guide	Traffic and Earnings.....436
Bars.....436	The Scrap Heap.....437
EDITORIALS:	Old and New Roads.....437
Settling the Railroad War.....434	Locomotive Returns.....440
The Grain Movement for	The Philadelphia Awards.....439
Twenty-two Weeks.....435	

Editorial Announcements.

PASSES.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

ADDRESSES.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

ADVERTISEMENTS.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

CONTRIBUTIONS.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

SETTLING THE RAILROAD WAR.

A restoration of through rates was rumored last week as likely to result from a conference of Baltimore & Ohio, Pennsylvania and Erie managers in New York. It is possible enough that the conference was intended to hasten the "settlement" of the pending difficulty; but it must have been somewhat such a "settlement" as might have been aimed at by a conference between Generals Lee, Longstreet, Jackson and Stuart in the face of the Federal army; that is, it was a conference of allies and not of antagonists, and as the New York Central & Hudson River, which in this case is probably regarded as the common enemy, was not present and was not even invited, we may infer that it was not a treaty of peace nor even an armistice that was aimed at, but rather the development of a policy, which may be a plan of campaign, or the settlement of the basis on which peace will be acceptable to all the parties on their side of the contest—a matter worth considering as the close of navigation approaches and with it the season when east-bound rates at least are almost always advanced, and when, probably enough, it will become really necessary to advance them to prevent the choking of the roads. Meanwhile Mr. Wm. H. Vanderbilt is reported as saying that "when the other roads are willing to consent that the freight rates from the West should be the same to New York as to Baltimore and Philadelphia, the New York Central will be ready to make an agreement as to the rates, but not sooner." This is anything but encouraging as to a settlement of the troubles, for this basis will be looked upon by the Baltimore & Ohio at least as a practical abandonment of the grain export business by its road—a business which has attained immense proportions within two years past, and has been maintained throughout the season of reduced rates. The fact (if it be a fact) that the New York Central can carry to New York as cheaply as the Baltimore & Ohio can to Baltimore will make no difference to the last-named road. What it wants is some profit on a share of the export traffic, not necessarily as great or half as great a profit as the New York Central is able to make on similar business. And it will not cease to work for a share of this business, and for as much as it can get, so long as there is any profit to be got from it. If the New York Central's expenses can be reduced so low on its through traffic that what is the bare cost on its rivals'

lines will yield it a profit, then it can maintain its position under almost any conceivable circumstances; but if the rate which it maintains leaves any margin for profit to the Pennsylvania and the Baltimore & Ohio, they will certainly carry a share of the traffic though they should be bankrupted a score of times. The only way to maintain rates on a basis more favorable to New York than to Philadelphia and Baltimore (whatever that may be) and yet profitable to the carrier to New York, is first to bankrupt and then to buy the Philadelphia and Baltimore railroads. Bankrupting alone will not do. Bankruptcy does not destroy a railroad, it only changes its owners—substitutes for those who expected a large income from the property proprietors who are satisfied with a smaller one. And just so long as any profit is left on a business, the new owners of the railroad will surely try to get such business.

It may be contended, however, that equal rates to the three ports in question will not be such a discrimination in favor of New York as will destroy or greatly reduce the export traffic of Philadelphia and Baltimore. If so, the New York Central's position is sound. The same arguments which prevent the more southern roads from giving up their traffic to Baltimore and Philadelphia will induce the New York Central to oppose any policy that will result in a diversion of business from New York, and if it cannot keep the traffic otherwise we may be sure that it will maintain rates as low as those to the other ports, and even lower, unless such rates leave it absolutely without profit in the long run. And the developments of the past year give good reason to question whether such a discrimination as has heretofore been made and conceded is necessary to enable Baltimore and Philadelphia and the carriers to those places to secure a large share of the export traffic. Formerly their business had to be encouraged; now it is well developed and established. And the differences heretofore maintained were really very large—larger than appeared from the tariffs; for in addition to the five cents per hundred in the regular freight rate the railroad companies gave a drawback of five cents per hundred on all grain exported from the southern ports, making altogether a difference of twenty dollars per car-load in their favor as against New York. A few months ago the drawback on exports was reduced to one-half, and a little earlier the difference in rates was changed from an arbitrary five cents per hundred to a percentage which would be but five cents in favor of Baltimore when the grain rate is 40 cents to New York, and but 2½ cents when the rate is but 20 cents, as during the past five months. Even at current rates, however, there is a difference of five cents a hundred, or 2.8 cents per bushel on corn, in favor of shipments to Baltimore, and of 2½ cents per bushel in favor of Philadelphia shipments as compared with New York. These differences amount to \$9 and \$10 per car-load, and have been sufficient (if they alone have determined the course of shipments) to attract enormous quantities of grain to the ports so favored.

If the effort to maintain equal rates to these three ports should fail, it is still questionable whether the basis agreed upon last winter, that is rates just in proportion to distance, however high (or low) these rates may be, can be maintained. We have seen that this season, when this proportion amounted to but four and five dollars per car-load (in addition to the export drawback of five dollars) the Philadelphia and Baltimore receipts have been enormous, and the corn exports of each larger than those from New York. Now it is reasonable to suppose that with the common winter rate of 40 cents per hundred the additional difference of four and five dollars per car-load would still further divert traffic from New York. Grain merchants are nearly as anxious to save five dollars on a bill for \$80 as on one for \$40, and no basis of rates is likely to be permanent which induces a different distribution of traffic when rates are high from that which prevails when rates are low; which causes New York to receive most of the rail grain in summer and almost destroys its grain trade in the winter.

It is not reasonable to expect that rates can be settled on a permanent basis now, whatever the disposition of the railroad managers may be. There is reason to believe, as we have seen, that the basis heretofore prevailing work against New York under the existing circumstances. But we cannot say what would be an equitable basis without experiments. The practicability of any proposed system can only be proved by practice. No company will adhere to a basis which destroys its business, however favorable it may have thought it and however warmly urged it when it was first proposed. But one obstacle to an agreement meets us on the threshold: What will be considered an equitable division of traffic? If each of three companies insists that its favorite port should get one-half of the traffic, it is of little use to talk of a basis of rates, for whatever might be adopted, the result would inevitably be unacceptable to one and probably to two and even to all of the parties to it. Before the managers attempt to make such a tariff as will give each port its "fair share" of traffic, they should come to some understanding as to the proportion which shall be considered a "fair share."

The Coal Roads.

Philadelphia & Reading stock, which was held up firmly at 44 (\$50 shares)—that is with next to no depression—for three weeks after the first coal auction which brought down with a run the other coal stocks, broke finally last week and seems to have fallen faster and further in proportion to the firmness with which the price was maintained. This week the price has been as low as 20, the fall in about a week having been about 55 per cent. It is reported that the early firmness of the stock was due to the support given by capitalists, and especially by the English bankers of the company, and that the final collapse was due to the fact that investors—those in America at least—were ready to let their entire holdings go at 44. The company was the first of the coal-carriers to pass a dividend, and thus seemed to prepare early for the coming storm; but this had but little effect on the price of the stock, the public having great confidence in the management, which confidence seemed confirmed by what appeared to be conservative action. The stock of the company is more than \$34,000,000, and the recent fall in price takes more than \$16,000,000 from its current market value. Much of the stock, we believe, is held in England, but a great deal is owned in this country, a 10 per cent. stock which could be had for about 110 (as it could be while it was paying dividends) being very attractive to investors who wish to receive a large income from a small capital.

Generally the coal-carriers' securities have fallen within a week, though the recent auction sales showed an improvement in the price of coal in spite of the large quantities offered. Investors remember that the coal companies have been insisting that they could not afford to mine and carry coal at much less than the combination prices, and now that the ruling rates are a dollar and a half lower they conclude that the margin for profit must have vanished quite. They have also been led to examine the capital accounts of the coal-carriers, and they find them enormous, requiring a very large profit from coal to keep the companies solvent. It is true that these capital accounts may easily be misleading, for they cover, besides the railroad properties—of whose value some idea can be formed—also enormous coal-land and coal-mine properties, about which it is very difficult to know anything positively. A thousand miles of a railroad which has had for a series of years a known amount of traffic, one can estimate to be worth so much; a thousand acres of coal lands may be worth much, and may be worth no more than Col. Mulberry Sellers' estate in the "knobs of Tennessee." For the coal companies' reports do not inform us how much coal has been raised at their mines, at what expense, and for how long a time. There is an impression that the companies have bought a great deal more coal property than they can use; and considering the way in which the business has been conducted, it is evident that, aside from investments in unopened coal lands, there must have been an excessive investment in mines actually worked, and probably a large waste in working them. For nearly the entire yearly supply of anthracite is sometimes raised within six months (owing to strikes). A corollary of this fact is that the mines worked are nearly twice as numerous as they need be; that an enormous capital has been sunk in opening and providing with machinery these superfluous mines, and more is being wasted constantly in keeping them pumped out and in working order; while the greatest waste of all, perhaps, is in maintaining an army of workmen to labor six or seven months in the year. Indeed, the difficulty with the miners is sufficient to explain nearly every other difficulty. It being a fact, verified by years of experience, that the miners would be idle nearly half of the time, the only way in which the demand could be supplied was by developing double the mine capacity that would be required if operations could be carried on regularly throughout the year. And it is not necessary to assume that the people engaged in coal-mining and carrying were either fools or rogues because they did what they have done—that is, provided means for supplying the demand for coal under the actually existing circumstances. Doubtless they have done something more than this; and have provided for a larger production, even with the demoralized labor, than could be disposed of in the most prosperous times; but they had no alternative (assuming, as we may, that they could not induce the men to work twelve months in the year) but to develop such a coal-producing capacity as, worked all the year round, should glut all the markets and force prices down below the amount needed to pay interest on the capital actually invested.

The coal-carriers which had no outlets of their own to the sea-board have also had to meet a temptation which some of them have not been able to resist, due to the very large traffic which they could absolutely command and the remunerative rates for coal-carrying maintained for many years. That is, such an interior carrying company was loath to yield its coal to another company to carry to the sea-board, inasmuch as its own business would return a good income on the cost of a new road. Thus railroads have been built, not because there was too much business for the capacity of those previously existing, but

because there seemed to be enough to yield good profits on the cost of an additional one. The truly economical policy, of course, would have been to concentrate all the traffic possible on a single line, and thus save paying interest on the cost of a second one. However, the coal companies are by no means the first to build superfluous railroads. That has been one of the commonest of errors throughout the country, and the only peculiarity of the coal companies is that they are later than others in meeting disaster.

The Grain Movement for Twenty-two Weeks.

The shipments of grain of all kinds from the eight principal Northwestern markets for each week since April 22 have been, in bushels, by lake and by rail:

Week ending—	By lake.	By rail.	Total.	Per cent. by rail.
April 29.....	1,634,541	2,072,946	3,707,487	56
May 6.....	2,445,191	2,292,638	4,737,829	48½
" 13.....	1,536,526	2,302,940	3,841,466	60
" 20.....	1,602,170	2,016,304	3,618,474	55½
" 27.....	1,747,408	1,820,456	3,567,864	51
June 3.....	2,412,102	1,797,922	4,210,024	42½
" 10.....	2,894,915	2,147,670	5,042,585	42½
" 17.....	2,921,405	2,591,811	5,513,216	45
" 24.....	2,728,706	2,198,054	4,926,760	44½
July 1.....	1,821,155	1,784,548	3,605,703	49½
" 8.....	1,765,010	1,205,184	2,970,194	40½
" 15.....	1,648,508	1,226,678	2,875,186	42½
" 22.....	2,269,336	1,092,825	3,362,161	31½
" 29.....	1,486,502	1,038,208	2,524,710	41½
Aug. 5.....	2,065,243	1,383,268	3,448,511	38½
" 12.....	1,744,059	1,300,720	3,044,779	42½
" 19.....	2,150,292	1,614,256	3,764,548	42½
" 26.....	2,352,152	1,520,811	3,872,963	39½
Sept. 2.....	1,698,491	1,573,088	3,271,579	46½
" 9.....	2,374,473	1,818,411	4,192,884	43½
" 16.....	2,663,334	1,688,318	4,351,652	36½
" 23.....	2,268,894	1,820,361	4,089,255	44½
Total for 22 weeks.....	46,502,773	37,949,382	84,452,155	45

The shipments are smaller than for the two previous weeks, yet are still large. The loss is wholly in the lake grain, rail shipments being the largest since June.

For the same 22 weeks the receipts at the different Atlantic ports have been:

	Corn.	Per cent. of total.	All grains.	Per cent. of total.
New York.....	14,335,766	31.8	37,017,135	44.1
Boston.....	4,898,203	10.8	6,519,230	7.8
Portland.....	431,800	1.0	781,770	0.9
Montreal.....	2,550,874	5.7	9,146,963	10.9
Philadelphia.....	11,012,750	24.5	15,832,600	18.8
Baltimore.....	10,086,500	22.4	12,385,185	14.7
New Orleans.....	1,691,021	3.8	2,315,637	2.8
Total.....	44,994,914	100.0	83,998,580	100.0

New York continues to improve its position as a corn receiver, and during the last week it also advanced a little in total grain receipts, contrary to its course for some weeks previous. Baltimore and Philadelphia fall back a little in rank as corn receivers, but in receipts of all grains Philadelphia holds its position and Baltimore falls back a little.

During the last week, the percentage of the total receipts of corn at each principal port was: New York, 47½ per cent.; Philadelphia, 16½; Baltimore, 13½; Boston, 9½; Montreal, 8½. In grains of all kinds, these percentages were: New York, 48 per cent.; Philadelphia, 20½; Baltimore, 11½; Montreal, 8½; Boston, 8 per cent.

Corn continues to form by far the largest part of the receipts at the seaboard. For the last week it was 57 per cent. of the whole. But wheat at last is beginning to come forward from the Northwest, and for the last week the lake ports' shipments included a little more wheat than corn. For the whole season since navigation opened, 53½ per cent. of all the grain received at the seaboard has been corn. For two months and more, however, the proportion of corn has been 59 per cent. For the part of the calendar year ending Sept. 23, corn has formed about 56 per cent. of the total seaboard grain receipts—the proportion as well as the absolute quantity being unexampled. It cannot be expected that this proportion should continue through the fall months. The last year's crop is usually pretty well marketed by this time, while the new one will not come forward for some months. With wheat the chief grain, probably New York will take higher rank among the grain receivers.

The Men Who "Know It All."

There seems to be something about the occupation of a railroad man which intensifies personal character. We have seen arbitrary men grow more dogmatic and inflexible year by year, and meek men who became more plastic the longer they were subject to authority, prompt men who grew to be as imperious as Napoleon, exact men whose methods ultimately would have done credit to scientific research, lazy men who by practice learned constantly how to do less, industrious men whose intentions were stronger than their power of fulfillment and who ultimately succumbed in health and strength, visionary men who dreamed fresh dreams and more of them month by month, conservative men who shrank from season to season with a sort of envelope of unimpressibility like a caterpillar into its cocoon (leaving us skeptics, however, whether they would ever emerge butterfly fashion), sanguine men for whom the future was always drawing compound interest on the past, honest men whose scruples grew more strict as their lives lengthened, dishonest men who received more and bigger bribes as they grew older, wise men who learned wisdom with their experience, profane men who swore oftener and more irreverently the longer they were employed on railroads, ignorant men whose minds seemed to grow more dense the longer they fulfilled the duties of their calling, and conceited men whose knowledge and wisdom in their own estimation far surpassed that of all the philosophers and sages. It is this latter class to which we wish to give a little attention—the class whose conceit coupled with dense ignorance obstructs all the avenues which lead to improvement, and who, if they could, would snuff out all the lights of knowledge excepting their own prescience, and make bonfires of libraries and barbed

of philosophers. So self-satisfied are they in their own conceit that a suspicion of their own ignorance never dawns on them; but, to employ a common phrase, "they think they know it all." There is something exceedingly hopeless about this state of mind. You talk to such men about the advantages of the improved form of rail sections with comparatively thin web or stem, and they will say "I don't like it," as if their likes and dislikes were the final court of appeal in such matters. So wrapped up are they in their own opinions that they do not seem able to conceive that there may be reasons and causes which determine what is right or wrong, good or bad, quite distinct and separate from their own self-consciousness. If you gently ask for reasons for their faith or rather prejudice against the form of rail, they may venture the guess that the web is too weak and that the rail will bend over. If you demur and say that many miles of such rails are in use and no such trouble has been experienced, or if you refer him to experiments which have been made with rails having much thinner webs and show him that these were still stronger than the resistance of the spikes, and that before the web would bend or break the spikes could be drawn out, he will tell you that such may be the case in theory, but in practice it is different. At this stage of the argument the man who "knows it all" will usually not hesitate to say what is not true in order to defend his own position, and will tell you that he has seen plenty of such rails which had given way laterally, and that at any rate if they do not do so they will, and even if they don't they are too weak in the head and will splinter off on the side. You mildly suggest that while this may have been the case with some of the first forms of such rails, the heads of which were not deep enough, but were made very convex on the side, so that with iron imperfectly welded such rails did splinter off, but that with more recent forms the heads of which were deeper and flat on the sides and the rails made of better material instead of bad iron, no such difficulty existed. He will then probably lead you to a pile of old rails, and show you triumphantly specimens of just such rails as you have described made of the poorest iron and torn into shreds by hard usage. "There," he says, "are your new-fangled rails." "There," you say, "are the old and imperfect forms made of bad material." "They have done just what I said they would," he says, while you protest that they are not a good pattern or good material; and he ends as he began by a proclamation that he "don't like 'em."

If you talk about locomotives and suggest that their improvement in economy of fuel and performance generally has not kept pace with the improvements which have been made in marine and other engines, he will quite likely say that the reason is because railroad companies will not use his patent grease pot. "You see it takes too much power to overcome the friction. Things are not lubricated right, but my grease pot just puts the oil where it is needed and saves all that is not needed." If inclined to be argumentative and at the same time conciliatory, you may say to him that probably his grease pot is a good thing, but that you think there are other sources of waste, such as loss of heat by radiation, the use of wet steam and impure water, and imperfect combustion, whose aggregate amount is greater than that which could be saved by greasing properly. It might also be suggested to him that a great deal might be saved by keeping an accurate account of fuel consumed by each engine, thus enforcing greater care and economy in the management of engines. Now to such suggestions the man who knows it all is quite invulnerable. He don't believe it pays to keep an army of clerks to keep accounts of the fuel used; "besides, what is the use? it must be paid for just the same whether you keep an account or not, and it is just as well to save the money it costs for clerk hire. As for locomotives, you can't teach him nothing; he knows about them practically; he has run engines and knows what they can do. Theories are all nonsense; he can tell what a locomotive will do without any of your theories."

If you talk about signals, he will ridicule all the recent improvements, and tell you that the interlocking system of switches is too complicated for practical use, and costs more than it comes to, and the block system is all a humbug. "If a man hasn't sense enough to keep out of the way of other trains, it is better to discharge him and get good men who know what they are about. This signal business, anyway, is all a humbug. Them Englishmen better come over here and learn how to run a railroad, instead of talking to us about their dam signals."

The man "who knows it all" has an unlimited amount of such talk. His chief characteristics seem to be a contempt for what other people know, and a very exaggerated idea of the value and correctness of what he knows himself. It is quite difficult for any one engaged all his life in learning, to realize the true state of the mind of the man "who knows it all." Such men are seldom entirely stupid. They have a sort of aptness to learn from what they see but unfortunately they seem incapable of realizing that other people have also been seeing and learning as well as they. Then too it is probable that such persons are deficient in imagination. They cannot conceive of the existence of knowledge of which they are ignorant. They seem to feel about it as children do about the question whether the fall of a tree in a wilderness with no one within hearing distance produces any sound, so our knowing friend does not seem capable of conceiving of knowledge which he does not know, and in this way what he learns he comes to regard somewhat as though he were the original inventor or discoverer of it. He reasons in this way: "If I know a thing, it is true; what I do not know is all humbug."

One of the causes which produce this condition of mind is the fact that such persons usually acquire information only by personal observation. They seldom are reading men or accustomed to accept information on the testimony of others, and this fact implies a certain amount of incredulity. It is true that we all acquire more or less of this with experi-

ence and age, but those who seek knowledge and are always loyal to the truth acquire with experience more or less discernment, which enables them to distinguish true testimony from that which is false, and therefore the effect is to lead them to read and to hear more testimony rather than less, in order that they may find more grains of real value, although they may be, as we all are, obliged to reject vast quantities of chaff. The man who "knows it all" finds it much easier to make a sweeping generalization and declare all other knowledge than his own folly, and is more content in the contemplation of his own wisdom than in learning from others.

There is but little hope for a person who has reached mature life with the conviction that he "knows it all." Early education usually is a cure or preventive, but nothing but a sentence to hard labor for the rest of his days will save society from the ills which the man who "knows it all" can inflict on those compelled to come under his influence.

He is especially dangerous in positions of authority, because if he happens to be wrong there is no hope of his getting right, and the blunders of any one with power to enforce obedience are multiplied in proportion to the number of those who are compelled to obey.

It may be set down as a good rule in appointing officers on railroads or elsewhere to ask first whether he "knows it all." If he does, reject him, because a man's capacity and willingness to learn form a very important qualification to enable him to command wisely, and no one man ever knows or can know so much as not to be obliged constantly to learn more. A good question to ask about a candidate for a position of responsibility is, What capacity has he for acquiring knowledge? because if he thinks he knows it all, he will gradually become less instead of more efficient and useful as he grows older.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Ohio Central.—This road (late the Atlantic & Lake Erie) has been extended from Bremen north 11 miles to Pleasantville, O. **Dayton & Southeastern.**—The first track is laid from Xenia, O., east to Jamestown, 11 miles. It is of 3-ft. gauge.

Grayville & Mattoon.—The first track is laid from Olney, Ill., northward to Newton, 20 miles.

Burlington & Southwestern.—Completed by laying track from a point six miles south of Unionville, Mo., south to Browning, 26 miles.

Joplin & Girard.—The first track is laid from Girard, Kan., east 10 miles.

This is a total of 78 miles of new railroad, making 1,677 miles completed in the United States in 1876, against 804 miles reported for the corresponding period in 1875; 1,101 in 1874, 2,778 in 1873 and 4,970 in 1872.

A LOCOMOTIVE MAN-CATCHER is advertised for by the Russian Government—something which will gently pick up the wayfarer walking on the track and deposit him in an uncrushed condition out of the way of the train. It will be, we suppose, a development from the American cow-catcher, though the development must go a great way. The cow-catcher is a reasonably efficient contrivance for securing safety to the train, but the safety of the cow seems not to have been much regarded by its designers. These animals (and larger and smaller ones, including men) are usually removed from the track by the cow-catcher, but generally in a mutilated or disabled condition, valuable practically only as a basis of suits for damages against railroad companies; and often more valuable thus than they ever were or could have been, had they never made the acquaintance of the cow-catcher. It will be interesting to know what kinds of devices will be offered to the Russian Government. We have in mind a considerable class of inventive geniuses on this side of the Atlantic, who, we think, would take great delight in devising apparatus to meet the requirements, and receive the roubles, of the Russian Railroad Administration. We even imagine that we can already see their claims filed in the Patent Office: "I claim the air cushions, and the flexible fingers, and the jointed levers, and the inclined planes, and the feather-bed, and the combination of the air cushions, flexible fingers, jointed levers, inclined planes and feather-bed, substantially as set forth." Next we suppose that we will have application for the invention of an apparatus to remove soldiers from the path of a cannon ball, "without serious injury." However, our own columns bear witness to the fact that animals, and sometimes persons, are thrown from the track by the cow-catcher occasionally without serious injury, even with trains running at a considerable speed. The stories are always told as marvels, however, and we believe that no where yet is it safe to neglect the injunction to "look out for the locomotive when the bell rings."

SIX MILLION DOLLARS A MILE, according to a Chicago paper, represents the average investment on American railroads, and it urges that these railroads should "receive a fair return" on this investment. Alas! for the people, if they must pay interest on such an amount; it would require an average contribution of more than \$500 for every man, woman and child in the country to pay even 5 per cent. on such a capital.

Contributions.

Steel as a Material for Wheels.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A very few solid steel wheels are shown at the Centennial, part of them being among Krupp's goods. Several broken pieces are exhibited which reveal both the character of the metal and the exact thickness of the plate. One of these wheels, about 36 in. in diameter, is not materially lighter than our best cast-iron wheels in actual thickness of metal, although the curved outline of it is somewhat different.

It appears extremely probable that our own next important ad-

vance in wheel-making will be in this very direction, viz.: the introduction of solid steel wheels. The developments of the last five years in the art of making tough steel castings to exact pattern have been so great and so favorable, that at the present moment but little more than the high cost of production really stands in the way of the use in the body of the wheel of the solid steel itself. It is more than likely, however, that with the continued help of the Siemens furnace for melting, and with a little more judicious competition, the price of such steel castings will be reduced to the point at which they can begin to compete with the best cast-iron wheels.

It is quite certain also that some change in the outline of the wheel plate can be made to great advantage when the use of this material, possessing as it does a high tensile strength, becomes fully understood, in castings of this form and general character. Just how far the high temperature at which it must be cast, and from which the metal must harden and be partly cooled in the wheel mould, will be troublesome, is one of the questions which time and trial alone will determine. It is certain, however, that no insuperable difficulties will be found, and, probably, with all the accumulated experience in cast-iron wheels, they will be less by far than those through which our wheel-makers have already passed.

The growing tendency to favor the use of wheels furnished with separate rolled steel tires—a practice which is in every respect to be commended—simplifies materially the task of adapting steel, cast to exact pattern, to service in wheels. Experience seems to show that when all the chances of imperfect manufacture and of inferior material are considered, the use of a steel tire gives a more durable wearing surface than can be obtained in any other way; or that if the use of a separate tire be conceded, then the problem becomes quite a simple one. It is certain that in steel of the right quality a hub of considerably less weight than is common in cast iron will resist perfectly the stress due to the pressure by which it is forced on to the axle, and that there will be also an ample margin of rigidity to resist any tendency to stretch and become loose upon the axle, by any vibration to which it may be subject. It seems also certain that a plate, or body of wheel, of 15 per cent. less weight, if not 25, than the common iron wheel, will be found sufficient for the purpose; for the tire not only possesses in itself all the strength it needs but it has something to spare to contribute in a certain sense to the general strength of the wheel. Just how far, however, this surplus in the tire can be made available in behalf of the rest of the wheel will depend wholly upon the method of holding the tire in place on the wheel, and this need not be here discussed. It is certain, however, that the body of the wheel has only itself to look out for, on the general score of strength and stiffness; and a knowledge of just what is needed, in this respect, will be arrived at rather by an attentive study of the light wrought-iron wheels and of the wooden wheels which, in various ways, have been used upon railroads, than by any comparison with existing patterns of cast-iron wheels.

This consideration is also in favor of the use of lighter steel wheels, that the conviction is deepening in the minds of our railroad men that it is imperative that weight should be saved in all our rolling stock, especially in those parts that lie below the springs. While the way is hardly clear yet to a reduction in the weight of the axles, since size of journal is an all important element in them, yet the wheel question is much nearer an actual solution, and should be pushed with vigor by those interested.

One other consideration bearing upon this subject may be named, that the judgment of all designers of rolling stock is in favor of a decidedly less weight upon each pair of wheels, the sleeping car and parlor car business having been sadly overdone in this particular. It is obvious that with each reduction in the standard of weight that must be carried upon each wheel, a somewhat corresponding reduction may be made, and ought to be made, in the weight of the wheel itself, and this requirement in every way favors the use of the solid steel as a wheel-making material.

Whether solid steel driving-wheels will come into use in our locomotives, rather than the light but very costly wrought-iron wheels so universally used abroad, is a question involving some additional difficulties. No one can doubt our ability to make the wrought-iron wheels as cheaply as any one can, but, fortunately, in the past at least, we have had by no means the same need to use wrought iron in these wheels that foreign designers have been subject to. Our strong cast iron has stood us in good stead here, as well as in other locomotive details, and we have almost invariably adhered to its use.

The advance of steel as a structural material renders it doubtful whether the possession of so admirable a thing as our strong cast iron should be called always, or much longer, a fortunate thing, since it may very easily come to block the way to a more rigid and exhaustive study of the conditions of many details of construction, and so really prohibit the use of the better material. There is even more reason to believe that solid steel driving-wheels will come into use, displacing the cast-iron wheel without permitting the farther use or trial of wrought iron for this purpose, than there was years ago for believing that the straight axle and the outside cylinder would ever so completely displace the crank axle and the inside cylinder, without the pretence, in this country, of using steel for the crank. English engineers obliterated the breakage of cranks by putting in steel, while our own stepped over the crank entirely, and ousted it altogether from our locomotives, as well they might with our rough roads and materials so imperfect as they then were. Somewhat so it may be, and indeed ought to be, in wheel materials: the interval between cast iron and solid steel, now occupied by foreign builders with wrought iron, should be entirely passed over by us, and steel should be introduced, improved and trusted in as in every way a more desirable, cheaper and a safer material.

Erecting Locomotive Guide-Bars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your correspondent "Practice" objects to my "Directions

for Erecting Locomotive Guide-bars," and says that there is no builder that he is aware of but assembles the parts in the erecting shop. The directions were in the first place for repair shops as well as for new engines in shops that have no assembling arrangement for guide-bars; and that there are such one of the proprietors of one of the very largest locomotive-building shops in the country informed me. I believe that there are vastly more bars erected without assembling devices than with them, because there are more old bars than new ones set.

My attention was called to the subject from the fact that a large proportion of such bars are not set as well as they should be. This I know to be a fact, and an inspection of the engines at the Centennial will prove it. Furthermore, a fine fit, that is to say such a fit as I was required to make them, cannot be made by any assembling process, and there would be but very little time saved by the operation. Let "Practice" try some such erected guide-bars with marking, as directed in my previous letter, and he will find that they do not fit. My remarks were made from an experience with very nearly one thousand guide-bars. A good deal of faulty work may be found upon many locomotives, and I know now where to put my hand on one that is placed for inspection and on which slips of paper can be placed between the return crank (for working the pump) and its seat upon the crank-pin, while a new 3-cent piece is slipped in between the connecting-rod key and the key way. Another and adjacent engine has the piston-rod cross-head keyed on askew, so that a thick card will easily pass between the guide-bars and guide-block at diagonally opposite corners, while at the opposite respective ends of the guide-block it fits the bars. Observation of this particular case directed my attention to the subject. I at first thought the bars were out of line, but a moment's reflection showed me that such could scarcely be the case, for the bars would in that case be too far out of true with the bore of the cylinder to render the supposition entertainable. I then examined other bars and found in many cases the top one not adjusted, hence my "Directions for Setting Locomotive Guide-bars," which will, if followed, leave good work—better in fact than is possible with assembling devices.

THE WRITER OF THE DIRECTIONS.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Grayville & Mattoon.—Mr. R. J. Lawrence is Chief Engineer. His office is at Olney, Ill.

Toledo, Peoria & Warsaw.—The following circular bears date Oct. 1:

"Mr. J. W. Palmer having resigned the position of Master Bridge-Builder, the office is hereby abolished.

"Mr. H. Bissell is hereby appointed Assistant Engineer, and will have supervision of the bridges, in connection with his other duties.

"Mr. W. M. Smith having resigned his position as Car Accountant, W. S. Palm, Stationer, is hereby appointed Car Accountant in his place, and will hereafter fill both of above positions.

"C. B. Plantz having resigned his position as Assistant Train Dispatcher, F. W. Dunn is hereby appointed in his place.

"The above appointments to take effect from this date."

Peoria, Pekin & Jacksonville.—Mr. Charles Macabe is appointed General Passenger and Ticket Agent.

Keithsburg & Eastern.—Mr. J. K. Hornish has been chosen President.

Helena & Iron Mountain.—At the annual meeting recently the following directors were chosen: Wm. Bailey, W. E. Moore, Bart. Y. Turner, W. H. Howes, John J. Horner, D. W. Davis, T. M. Jacks, J. H. Burkholder, J. V. Westlake, Jas. M. Leversque, H. P. Rodgers, J. D. Lowmber. The board elected T. M. Jacks, President; John J. Horner, Vice-President; Samuel I. Clark, Secretary; John P. Moore, Treasurer.

Northern Pacific.—At the annual meeting in New York, Sept. 27, the following directors were chosen: Charles B. Wright, J. Frailey Smith, Joseph Dilworth, Richard L. Ashurst, Philadelphia; Johnston Livingston, George W. Cass, Alfred E. Tilton, New York; Benjamin P. Cheney, John M. Denison, Boston; George Stark, Nashua, N. H.; Frederick Billings, Woodstock, Vt.; Charlemagne Tower, Pottsville, Pa.; Alexander Mitchell, Milwaukee, Wis. The board re-elected Charles B. Wright, President; George Stark, Vice-President; Samuel Wilkeson, Secretary; George E. Beebe, Treasurer; George Gray, General Counsel. About \$17,000,000 of stock was represented and voted.

Louisville, Paducah & Southwestern.—Mr. M. J. McAuliffe has been appointed Auditor, in the place of T. J. Fitzgerald, resigned.

Nebraska.—Mr. C. D. Dorman has been chosen Secretary and Treasurer, in place of Charles D. Smith.

St. Louis, Iron Mountain & Southern.—Mr. E. A. Ford has been appointed General Passenger Agent. He has for five years past held a similar position on the Missouri Pacific, and, until recently, on the Atlantic & Pacific.

Lafayette, Bloomington & Mississippi.—The officers of the new company are as follows: President, C. R. Cummins, Pekin, Ill.; Vice-President, John Cheney, Bloomington, Ill.; Secretary and Treasurer, J. B. Cohers, Pekin, Ill.

Union Pacific.—The division superintendents on this line are now as follows: Eastern Division, F. J. Nichols, Omaha, Neb.; Mountain Division, W. P. Davis, Cheyenne, W. T.; Laramie Division, S. T. Shankland, Laramie, W. T.; Western Division, J. T. Clark, Evanston, W. T.

Florida Central.—Under decree of the Florida courts Joseph H. Durkee is now in possession of this road as Master in Charge. He has appointed Charles Holmes General Superintendent and W. M. Davidson, General Freight and Ticket Agent. The offices are in Jacksonville, Fla.

Shelby.—The officers of this road, until recently worked by the Louisville, Cincinnati & Lexington, are: F. Neel, President; George Petry, Superintendent.

Buffalo & Jamestown.—In the foreclosure suit recently begun the New York Supreme Court has appointed Mr. James N. Scatcherd Receiver. Mr. Scatcherd is President of the company.

PERSONAL.

—Major W. W. Vass, Treasurer of the Raleigh & Gaston Company for 30 years past, is seriously ill at his residence in Raleigh, N. C. He is suffering from typhoid fever.

—Hon. Joseph Warren, editor of the Buffalo Courier and one of the chief projectors and promoters of the Buffalo, New York & Philadelphia Railroad, died Sept. 30.

—Thomas S. Hall, the inventor of the Hall railway signals, met with a very painful accident at his residence at West Meriden, on Sept. 26. Mr. Hall has been an invalid for the past year, and had recovered sufficiently to walk with crutches. On Tuesday evening he made a misstep and fell, fracturing his leg in several places above the ankle.

—Mr. Watts Cooke, Sr., father of Messrs. John and James Cooke, of the Danforth Locomotive Works, and Mr. Watts Cooke, Jr., of the Passaic Rolling Mill, died suddenly in Paterson, N. J., Oct. 1, aged 84 years. Mr. Cooke was formerly a pattern-maker and had resided in Paterson for many years.

—Gen. Braxton T. Bragg, Chief Engineer of the Gulf, Colorado & Santa Fe Railroad, died suddenly in Galveston, Tex., Sept. 27. He was 61 years old, was a graduate of West Point, and was known chiefly for his services in the United States army before and the Confederate army during the war. He died from disease of the heart. His position on the Gulf, Colorado & Santa Fe was his only connection with railroads.

—Mr. James C. Tison, Assistant General Ticket Agent of the Atlantic & Gulf Railroad, died of yellow fever in Savannah, Sept. 18.

—Major E. M. Fuller, for eight years past Chief Engineer of the Philadelphia, Wilmington & Baltimore Railroad, resigned his position Oct. 1.

—Mr. W. P. Van Deusen has retired from his position as Auditor of the International & Great Northern road.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending June 30:	1876-76.	1874-75.	Inc. or Dec.	P. c.
Northern Pacific.....	\$739,746	.....	.....	.....
Expenses.....	449,719	.....	.....	.....
Net earnings.....	\$290,027	.....	.....	.....
Earnings per mile.....	1,333	.....	.....	.....
Per cent. of exps.....	60.79	.....	.....	.....

Nine months ending Sept. 30:

Chl., Milwaukee & St. Paul.....	\$5,861,000	\$5,605,558	Inc..	\$255,442	4.4
---------------------------------	-------------	-------------	-------	-----------	-----

Eight months ending Aug. 31:

Atchison, Topeka & Santa Fe.....	\$1,492,792	\$841,343	Inc..	\$651,449	77.4
Expenses.....	768,037	384,897	Inc..	373,140	96.9

Net earnings.....	\$724,755	\$456,446	Inc..	\$268,309	61.0
Per cent. of exps.....	50.78	45.76	Inc..	5.03	11.0

Burlington, Cedar Rapids & Northern.....	740,434	818,642	Dec..	78,208	9.8
Expenses.....	876,866	849,450	Inc..	27,216	5.0

Net earnings.....	\$163,768	\$269,192	Dec..	\$105,424	30.2
Per cent. of exps.....	77.89	67.12	Inc..	10.77	16.0

Louisville, Cincinnati & Lexington.....	707,910	709,183	Dec..	1,273	0.3
Expenses.....	518,721	.....	.....	.....	.....

Net earnings.....	\$189,189	.....	.....	.....	.....
Per cent. of exps.....	73.26	.....	.....	.....	.....

Month of July:

Denver & Rio Gra'de, Main Line.....	\$30,114	\$29,884	Inc..	\$130	0.5
Expenses.....	18,837	22,268	Dec..	3,731	16.7

Net earnings.....	\$11,277	\$7,716	Inc..	\$3,861	50.0
Per cent. of exps.....	61.56	74.23	Dec..	12.67	17.1

Month of August:

Atchison, Topeka & Santa Fe.....	\$248,138	\$152,215	Inc..	\$95,923	63.0
Expenses.....	117,800	55,610	Inc..	62,190	111.9

Net earnings.....	\$130,338	\$96,605	Inc..	\$33,733	34.9
Per cent. of exps.....	47.47	36.53	Inc..	10.94	29.9

Burlington, Cedar Rapids & Northern.....	77,951	112,769	Dec..	\$34,808	30.9
Expenses.....	70,215	91,382	Dec..	21,167	29.3

Net earnings.....	\$7,736	\$21,377	Dec..	\$13,641	63.7
Per cent. of exps.....	90.02	81.01	Inc..	9.01	11.1

Louisville, Cincinnati & Lexington.....	106,664	93,882	Inc..	12,782	13.6
Expenses.....	71,173	71,294	Dec..	121	0.3

Net earnings.....	\$35,491	\$22,588	Inc..	\$12,903	67.1
Per cent. of exps.....	66.70	75.92	Dec..	9.22	12.1

Toronto, Grey & Bruce.....	24,984	27,718	Dec..	2,734	9.9
----------------------------	--------	--------	-------	-------	-----

Month of September:

Chl., Milwaukee & St. Paul.....	\$646,150	\$741,206	Dec..	\$95,056	12.8
---------------------------------	-----------	-----------	-------	----------	------

Second week in September:

Denver & Rio Gra'de, Main Line.....	\$7,184	\$6,844	Inc..	\$340	5.0
Denver & Rio Gra'de, Trinidad Extension.....	2,656	.....	.....	.....	.....

Third Week in September:

Atchison, Topeka & Santa Fe.....	\$70,563	\$45,182	Inc..	\$25,441	66.2
Denver & Rio Gra'de, Main Line.....	8,029	5,806	Inc..	2,223	38.3
Denver & Rio Gra'de, Trinidad Extension.....	2,917	.....	.....	.....	.....
St. Louis, Iron Mt. & Southern.....	88,800	90,161	Dec..	1,361	1.5

Week ending Sept. 15:

Great Western, of Canada.....	\$17,666	\$16,043	Inc..	\$1,623	10.1
-------------------------------	----------	----------	-------	---------	------

Week ending Sept. 16:

Grand Trunk.....	\$30,100	\$37,000	Inc..	\$7,100	8.7
------------------	----------	----------	-------	---------	-----

Lumber Movement.

Receipts and shipments at Chicago from Jan. 1 to Sept. 27 have been, in square feet:

Receipts.....	762,171,663	862,890,192	90,718,529	10.6
Shipments.....	399,608,584	440,836,844	51,228,260	11.6

Cotton Movement.

For the period from Sept. 1 to Sept. 29 the receipts at the seaboard and the exports were, in bales:

Receipts.....	221,952	186,756	35,196	19.0
Exports.....	80,734	29,663	22,071	76.9

The receipts for the month have been exceeded but once in six years and are 27 per cent. greater than the average.

Coal Movement.

Coal tonnages for the week ending Sept. 23 are reported as follows:

Anthracite.....	499,631	544,718	Dec..	45,197	8.3
Semi-bituminous, Broad Top.....	3,731	.....	.....	.....	.....
" " Clearfield.....	18,011	23,820	Dec..	5,809	24.4
" " Cumberland.....	14,424	65,650	Dec..	41,226	74.0
Bituminous, Barclay.....	6,857	7,995	Dec..	1,138	14.0
" " Allegheny Region.....	3,674	.....	.....	.....	.....
" " Pittsburgh Region.....	34,854	38,691	Dec..	163	0.4

Shipments of Cumberland coal were prevented by breaks in the Baltimore & Ohio road and the Chesapeake & Ohio Canal caused by the storm of Sept. 17.

The Lehigh & Wilkesbarre Coal Company resumed work at all its collieries Oct. 2, with a full force and on full time.

The anthracite tonnage of the Belvidere Division, Pennsylvania Railroad, for the week ending Sept. 23 was: 1876, 26,730; 1875, 32,454; decrease, 5,724 tons, or 17.6 per cent. Of the tonnage this year 22,797 tons were from the Lehigh, and 3,933 tons from the Wyoming Region.

At the Delaware & Hudson Canal Company's auction sale, Sept. 28, the following prices were obtained: Steamboat, per ton, \$3.12½ to \$3.15; grate, \$3.17½ to \$3.25; egg, \$3.27½ to \$3.30; stove, \$4 to \$4.15. These prices are a slight advance upon those obtained at the Delaware, Lackawanna & Western sale.

The coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the nine months ending Sept. 30, was as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Coal Port for shipment.....	194,505	113,130	Inc..	81,375 71.9
South Amboy for shipment.....	321,622	171,686	Inc..	149,936 87.3
Local distribution on New Jersey lines.....	116,855	147,232	Dec..	30,377 20.6
Company's use on New Jersey lines.....	49,567	18,757	Inc..	30,750 163.6
Total.....	682,489	450,805	Inc..	231,684 51.4

Of the total in 1876, 478,747 tons were from the Lehigh, and 203,742 tons from the Wyoming Region. Actual shipments from Coal Port were 193,606 tons; from South Amboy, 349,393 tons.

Erie Canal Traffic.

The business of the canal at Buffalo from the opening of navigation up to Oct. 1 is reported as follows:

	1876.	1875.	Decrease.	P. c.
Tolls received.....	\$415,780 74	\$547,528 09	\$131,747 35	24.1
Number of boats cleared.....	3,454	4,466	1,012	22.7

The canal opened May 18 in 1876, and May 4 in 1875, so the average receipts for tolls per day were \$4,026 last year and but \$3,772 this year, a decrease of 31 per cent.

Grain Movement.

For the week ending Sept. 23 these receipts and shipments were:

	1876.	1875.	Inc. or Dec.	P. c.
Lake ports' receipts.....	4,360,186	4,386,541	Dec..	26,355 0.6
" " shipments.....	4,089,255	3,084,452	Inc..	404,803 13.0
Atlantic ports' receipts.....	3,234,870	3,586,717	Dec..	351,847 9.8

The proportion of shipments by rail from lake ports was 44½ per cent. in 1876, 37½ in 1875, and 13½ in 1874.

Chicago receipts and shipments for the week ending Sept. 30 were:

	1876.	1875.	Increase.	P. c.
Receipts.....	3,550,582	2,415,157	1,135,425	47.0
Shipments.....	2,313,367	2,034,835	278,532	13.7

Baltimore grain receipts for September were as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Flour, barrels.....	139,767	121,824	Inc..	18,043 14.8
Wheat, bushels.....	555,267	390,538	Inc..	164,729 42.2
Corn.....	1,954,831	920,847	Inc..	1,033,984 123.2
Other grain.....	83,196	126,959	Dec..	43,763 34.5

Total, bushels..... 3,222,696 1,886,542 Inc.. 1,336,154 70.8

For the nine months ending Sept. 30 receipts were as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Flour, barrels.....	1,033,267	1,050,632	Dec..	17,425 1.7
Grain, bushels.....	23,060,572	11,539,571	Inc..	11,521,001 99.8
Total, bushels.....	27,710,004	12,627,415	Inc..	11,442,589 70.3

The increase is chiefly in corn.

The Buffalo Commercial Advertiser reports receipts at that city as follows for the nine months ending Sept. 30, flour in barrels and grain in bushels:

	Flour		Grain	
	1876.	1875.	1876.	1875.
By lake.....	514,351	684,395	31,394,386	35,863,867
By rail.....	963,000	469,400	10,411,100	6,283,000
Totals.....	1,377,351	1,153,795	41,805,486	42,146,867

The increase in flour was 19.4 per cent., and the decrease in grain 0.7 per cent. Of the flour 62.7 per cent., and of the grain 34.9 per cent., came by rail this year. The shipments eastward of grain for the same period were:

	1876.	1875.	Decrease.	P. c.
By rail, bushels.....	10,204,875	10,914,270	709,395	6.5
By canal.....	19,725,243	23,760,272	4,035,029	17.0
Total.....	29,930,118	34,674,542	4,744,424	13.7

The rail shipments were 34.1 per cent. of the whole in 1876 and 31.5 per cent. in 1875. The canal opened May 4 in 1876, and May 18 in 1875.

Ocean Freight.

New York rates have not varied much for some weeks. Last Tuesday quotations were: Grain by steam to Liverpool, 8½d.; by sail, 7½d.; flour by sail, 1s. 9d. per barrel; bacon by steam, 30s. per ton; cheese by steam per ton, 45s. to 50s. A steamer was chartered to take 48,000 bushels of grain to Liverpool at 8½d. To Cork for orders by sail grain was taken at 9d. Philadelphia quotations for grain are 8½d. per bushel by steam to Liverpool and 9½d. by sail to Cork for orders.

At Baltimore last week rates were 10d. per bushel for grain to Liverpool by steam; tobacco to Bremen 35 marks (\$8.75 cents); per hoghead for Maryland up to \$12.50 for Virginia; grain, by sail to Cork for orders, 9½d. to 10½d.

THE SCRAP HEAP.

Railroad Manufactures.

The Roane Iron Company, at Chattanooga, Tenn., now employs 585 men and its shops are full of work. In one week recently the mill turned out 605 tons of iron rails, being the largest week's work ever done in the mill.

The Danforth Locomotive Works, at Paterson, N. J., have some orders for bridge work and some machine work on hand, but are doing little locomotive work at present.

The Chattanooga Iron and Steel Company's Works are nearly completed and were to start up about Oct. 1. The mill building is 102 by 117 feet, is provided with an engine of 100 horsepower, besides several smaller ones, and will make bar and plate iron, rail fish-plates, etc.

The Rogers Locomotive Works, at Paterson, N. J., have an order for ten engines on hand and are quite busy at present.

The York (Pa.) Car Works are at work on a large order for freight cars for the Texas & Pacific road.

The Grant Locomotive Works, at Paterson, N. J., have about completed their order for ten consolidation engines for the Lehigh Valley road, and very few men are now employed.

Utilizing Coal Dust.

The Pottsville (Pa.) Miners' Journal says: "We alluded, a few days since, to the shipment from Carbonate by the Delaware & Hudson Canal Company, of 250 tons of coal dust daily to a New York firm for consumption at tide water. We have since learned that these shipments have been going on from Honesdale ever since navigation opened, some fifteen thousand tons having been shipped from that point, and the available supply there exhausted. The culm goes principally to the Anthracite Fuel Company, whose works occupy the old shipping docks of the Pennsylvania Coal Company at Port Ewen, just below the mouth of Rondout Creek. The culm is here transformed into a fine locomotive steaming coal, and has

been for some months in extensive use by several of the New York railroads. The Delaware & Hudson Company is itself using large quantities of this fuel on its northern railroads, part of which it manufactures by its own machinery at Rondout, and part of which is furnished by the Anthracite Company. The product is the same, and the process and machinery that make it the same, as was that so successfully tried for the first time in the history of the industry in this country on the Reading Railroad between Port Richmond and Pottsville, July 31, 1875, with engine No. 353, Franklin Obold, engineer, with 125 cars, laden with 700 tons of coal. The regular schedule time on that occasion was beaten nearly two hours."

A Greenhorn's Experience on a Locomotive.

The following letter was received at the Railroad Gazette office in reply to an advertisement of the "Catechism of the Locomotive":

Sir: I was reading your advertisement, Greenville Democrat. Faith, it was a short [time] since that I jumped on a locomotive and thought to amuse myself. Some one after seeing, by pretending to be the engineer, telling me to throw back the lever, which I did. Upon my soul I never slood hur she ran out in a sand Bank ten miles from the spot. For the life me soule I pulled every lever to and fro, and faith I've never seen or heard from her since.

Would you please send me the price of your Book.

Yours truly

OLD AND NEW ROADS.

Denver & Rio Grande.

The operations of the Main Line (120 miles) for July are stated as follows:

Freight.....	\$15,077 75
Passengers.....	14,960 31
Miscellaneous.....	75 00

Total earnings (\$251 per mile)..... \$30,113 56

Expenses (61.56 per cent.)..... 18,537 48

Net earnings (\$96 per mile)..... \$11,576 08

Of the gross earnings \$764.17 were from transportation of troops and mails. As compared with July, 1875, there is an increase of 0.5 per cent. in gross, and of 50 per cent. in net earnings, on the same mileage.

Erie.

A telegram from Milford, Pa., dated Sept. 28 says: "At the session of the Court of Common Pleas now sitting here Col. J. Augustus Page, counsel for several of the fifth-mortgage bondholders of the Erie Railway, to-day moved that rule be entered amending the record and for judgment on failure to answer. This was opposed by Wm. Jessup, counsel for the Erie road, and Judge Waller decided that Mr. Page shall give ten days' notice to defendant. It is understood that this is the first step of a coalition of American capitalists toward getting possession of the Erie railroad at the foreclosure sale under the fifth-mortgage bonds."

Delaware, Lackawanna & Western.

At the last regular monthly meeting of the board of directors it was decided to pass the quarterly dividend usually declared in October. It was stated that during the first eight months of the year the road had earned enough to pay all interest and rentals and a surplus for stockholders, but not sufficient to warrant the usual dividend.

Lafayette, Bloomington & Mississippi.

The bondholders, who have purchased this road at foreclosure sale, have organized a new company under the same name, and filed articles of incorporation in Illinois. The capital stock is \$400,000. It is said that the new company has agreed to lease the road to the Lafayette, Muncie & Bloomington Company, as noted elsewhere.

New York & Oswego Midland.

The final decree of foreclosure and sale was entered in the United States Circuit Court in New York, Oct. 3. The decree, as already noted, provides for the sale of the property at Middletown, N. Y., the date to be fixed hereafter, and provides that the purchaser shall pay \$100,000 cash at the time of sale. Should no bid amounting to \$2,500,000 be received, the sale is to be adjourned from day to day until further order of the Court. The decree fixes the total indebtedness at \$9,976,023.

Davenport & Northwestern.

An attempt was made last week to stop the work on the extension of this road into Davenport, Ia., by the Sheriff of Scott County, who sought to enforce an old mechanics' lien which had been placed in his hands. The Receiver, however, refused to recognize his authority, claiming to act under orders of the United States Court, and that court subsequently ordered the Sheriff to appear and show cause why he should not be proceeded against for contempt.

There is talk of an extension of the Maquoketa Branch from Maquoketa, Ia., northwest to Cascade, about 25 miles, provided sufficient aid can be secured along the line.

European & North American.

The road from Bangor, Me., to Vanceboro was formally transferred, Oct. 2, to the Receiver recently appointed on petition of the trustees under the second mortgage by B. E. Smith, Trustee under the consolidated mortgage, who has had possession some time.

Portland & Rochester.

This company failed to pay the semi-annual coupon due Oct. 1 on \$350,000 first-mortgage bonds. The default is not altogether unexpected. A statement was to be presented at the annual meeting, Oct. 4. The company, we believe, has always paid the interest on its own bonds, although it has not for some time provided for the Portland city bonds issued in aid of the road.

Chesapeake & Ohio.

The Receiver has ordered a general reduction of 10 per cent. in all salaries and wages, on account of the depression in business and the low rates now prevailing.

Buffalo & Jamestown.

In the New York Supreme Court at Buffalo the Farmers' Loan & Trust Company, of New York, as trustee under a first mortgage executed in 1873, has begun suit to foreclose that mortgage. The complaint sets forth that the coupons due April 1, 1876, have not been paid and that a majority of the bondholders have requested the trustee to take action. It also claims that the company is insolvent and unable to pay and asks for a decree of foreclosure and sale.

The mortgage was for \$2,500,000, but the complaint in this suit puts the amount of bonds issued by the trustee at \$1,551,000, besides \$79,000 more believed to have been issued but not certified by the trustee, making \$1,630,000 in all. The amount outstanding by the last annual report of the company (Sept. 30, 1875) was \$1,100,000. At the same time the capital stock subscribed was \$1,509,700; paid in, \$1,156,900, and there was a floating debt of \$154,227. The road is 66½ miles long, from Buffalo, N. Y., southward to Jamestown, and was not completed until last year. Of the stock \$1,000,000 is held by the city of Buffalo and nearly all the rest by towns on the line, only a very small amount having been subscribed by individuals.

A special meeting of the stockholders was held recently, when it was proposed to make an assessment of 20 per cent. on

all the stock to relieve the company from its pressing embarrassments. Nothing could be done, however, as the municipal corporations holding nearly all the stock could not pay such an assessment without special authority from the Legislature.

The Court subsequently appointed Mr. James N. Scatcherd, President of the Company, Receiver.

Atlantic, Mississippi & Ohio.

Our Amsterdam correspondent writes as follows: "On call of Messrs. Ziegelaar and Luessen, on Sept. 18, a meeting was held of holders of the consolidated bonds of the Atlantic, Mississippi & Ohio. Though about \$3,000,000 are in the hands of our countrymen, only \$565,000 were represented, by 36 holders. The meeting was very stormy, Mr. Luessen accusing one of the issuing bankers, G. M. Boiesevain, with great animosity. After protracted discussion a committee was appointed, consisting of Messrs. Pick, de Morer, Oyens, Van der Waarden, Groedkoop and Carp. The Board of the Stock Exchange added to these five Mr. Van Vosterwijk Bruijn as chairman. The committee will probably act with that of the English bondholders."

Union Pacific.

The Commercial and Financial Chronicle quotes as follows from a letter addressed to the Money Market Review in London, over the signature of "Omaha," says:

"The President of the Union Pacific Railroad has written a letter in which he says: 'I regret as much as you do the present condition of the Omaha bridge bonds. I have been in Washington trying to prevent them abolishing the tolls. As long as we can collect the tolls, the interest will be paid and the bonds redeemed for the sinking fund. The mortgage could only be made a first mortgage by the consent of the first mortgage bondholders.' In answer to this, the President was applied to, to promise payment of interest unreservedly, independent of the toll question; but he does not alter his position, making the payment of interest contingent on the company's ability to collect the tolls. This position was maintained by the company before the Supreme Court. Their counsel said, in effect: 'The revenues derived from the railroad belong to the first-mortgage bondholders, and, if there be a surplus, it belongs to the shareholders. We seek to pay the Omaha Bridge bondholders out of the tolls of the bridge. If we are prohibited from collecting these tolls, we cannot pay the bondholders, as all other funds belong to the first mortgagees and to the shareholders.'"

Kansas City, Memphis & Mobile.

The property of this company is to be sold at bankrupt sale in Kansas City, Mo., Dec. 1. The property consists chiefly of a partly graded road-bed and some right of way.

Master Car Painters' Association.

At the annual convention in Philadelphia, Sept. 20, reports were presented on Priming and Preparations, by John H. Will, New York & Harlem; How to Paint a Car, Ready for the Varnish, by R. McKoon, Atlantic & Great Western; The Causes of Varnish Cracking, by J. W. Fleming, Lehigh Valley; Surfacing, by B. T. Beazley, Maine Central, and were freely discussed. The question relative to the comparative value of a car or coach painted with oil as compared with the durability of varnish, the old method, was discussed, the majority of the delegates being of the opinion that the varnish method was the most durable in the long run, and that oil has a tendency to decay the wood upon which it is placed. The matter was finally referred to a committee to experiment and report upon at the next annual meeting of the association. A committee was also appointed to prepare a paper on the best method of preparing and embellishing car-head linings. The Committee on Ornamentation, including Styles and Colors, was given another year to report. The convention agreed upon Albany, N. Y., as the place for the next meeting, to be held on the third Wednesday of September, 1877. The convention was well attended and much interest was taken in the proceedings.

Lafayette, Muncie & Bloomington.

In the suit brought by the directors of the company, asking for the appointment of a receiver, and seeking to obtain possession of the Western Division, a final decree has been entered by consent of all parties. The decree annuls the lease to the Toledo, Wabash & Western, and orders the transfer of the road to the Lafayette, Muncie & Bloomington Company. The transfer will be made as soon as the necessary arrangements can be completed.

It is said that the bondholders who now own the Lafayette, Bloomington & Mississippi road, have arranged to lease it to the Lafayette, Muncie & Bloomington Company, and that trains will be run through from Muncie, Ind., to Bloomington, Ill., the length of the line being 203 miles, and its course east and west, with a bend to the southward, near Lafayette. Its eastern connection at Muncie is with the Cleveland, Columbus, Cincinnati & Indianapolis.

Illinois Railroad Taxation.

The assessed valuation, given last week by the various roads has been finally adopted by the Illinois State Board of Equalization. In addition thereto ten companies are assessed by the board upon a equalized value of capital stock, being excess of stock and debt over tangible property, as follows:

Chicago & Alton.....	\$3,339,953
Chicago, Burlington & Quincy.....	4,404,761
Chicago, Milwaukee & St. Paul.....	124,900
Chicago, Rock Island & Pacific.....	1,341,270
Cincinnati, Lafayette & Chicago.....	77,424
Illinois & St. Louis Railroad and Coal Co.....	186,313
Indianapolis & St. Louis (lessee of St. Louis, Alton & Terre Haute).....	512,714
Joliet & Northern Indiana.....	68,091
Ohio & Mississippi.....	646,927
St. Louis, Vandalia & Terre Haute.....	595,853

Total..... \$10,106,217

Adding this to the property assessment gives the sum of \$44,329,794 as the total assessed value of the railroads of the State.

Pennsylvania.

The New York Tribune of Sept. 30, says: "The travel over the Pennsylvania Railroad reached its highest point during last week, when 249,697 passengers were transported to and from Philadelphia without the slightest accident or even an annoying delay. The following figures are from reports which were made lately to Samuel Carpenter, the General Eastern Passenger Agent, and represent the business solely of the New York Division of the Pennsylvania road:

Date.	General business.	To and from Centennial.
Sunday, Sept. 17.....	6,923	.....
Monday, Sept. 18.....	23,099	11,651
Tuesday, Sept. 19.....	20,123	17,794
Wednesday, Sept. 20.....	25,142	19,049
Thursday, Sept. 21.....	21,667	19,086
Friday, Sept. 22.....	22,806	16,184
Saturday, Sept. 23.....	23,171	17,092
Total.....	149,931	90,706
Grand total.....		249,697

"Probably never before in the history of railroads has so much baggage been in transit for the period of one season as during the past Summer and the present Fall upon the lines running to Philadelphia from New York. On Saturday last, from the returning trains, the baggage transferred at the Durosses Street Ferry amounted to 4,000 pieces, of which nearly

